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(71) Applicant: SONY CORPORATION  
Tokyo (JP)

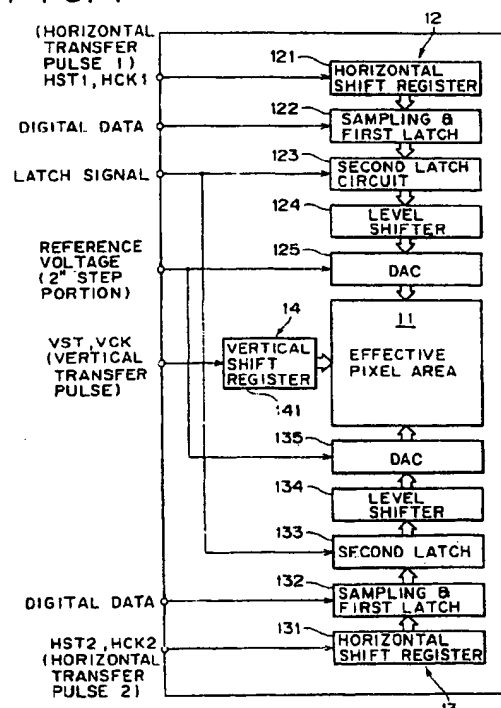
(72) Inventors:  
• Nakajima, Yoshiharu, Sony Corporation  
Tokyo (JP)  
• Maekawa, Toshikazu, Sony Corporation  
Tokyo (JP)

(74) Representative: Thévenet, Jean-Bruno et al  
Cabinet Beau de Loménie  
158, rue de l'Université  
75340 Paris Cédex 07 (FR)

(54) Data driver comprising a digital/analog converter for a liquid crystal display device

(57) A drive circuit (12, 13) integrated with the LCD device containing a digital/analog converter circuit (125, 135) has polysilicon thin film transistors arrayed in a matrix on the substrate as switching devices for the pixels. A level shift circuit (124, 134) in the shift register has a basic structure of CMOS latch cells and is utilized in each level shift of the clock signal at each transfer stage. A sampling latch circuit (122, 132) with a basic structure of CMOS latch cells has a level shift function. These respective circuits may be incorporated into a single scanning type structural circuit with the drive circuit-integrated liquid crystal display device to provide an LCD panel with an extremely narrow picture frame, stable level shift operation, stable sampling & latch operation in a circuit structure having an extremely small number of components, low power consumption and a small surface area.

FIG. 1



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# EUROPEAN SEARCH REPORT

Application Number  
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Y		46,47, 51,52	
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The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 3 June 2002	Examiner Lange, J
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application I : document cited for other reasons &amp; : member of the same patent family, corresponding document</p>			

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#### CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

- ☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):
- ☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

#### LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

- ☒ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- ☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.
- ☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:
- ☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:



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## EUROPEAN SEARCH REPORT

Application Number  
EP 99 40 3241

DOCUMENTS CONSIDERED TO BE RELEVANT			
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			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
The present search report has been drawn up for all claims			
Place of search <b>THE HAGUE</b>		Date of completion of the search <b>3 June 2002</b>	Examiner <b>Lange, J</b>
<p><b>CATEGORY OF CITED DOCUMENTS</b></p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application I : document cited for other reasons A : member of the same patent family, corresponding document</p>			

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LACK OF UNITY OF INVENTION  
SHEET B

Application Number

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The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. Claims: 1-16

decoder for D/A converter

2. Claims: 17-33

level shifter using voltage divider and having CMOS latch cell as basic structure

3. Claims: 34-45

sampling latch switching off power supply during sampling and on during latching

4. Claims: 46-53

latch using two different power supply voltages during latching and output operation

**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
The members are as contained in the European Patent Office EDP file on  
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